

Licensable Technologies

NO_x HyCat

Applications:

The NO_x HyCat is the first NO_x-reduction system for diesel engines that can be used in vehicles:

- sedans,
- vans,
- SUVs,
- light and heavy trucks, and even
- locomotives.

Benefits:

- Enables "dieselization" of U.S. vehicles to benefit from diesel's 25% to 35% mpg advantage over gasoline engines.
- Allows diesel-powered vehicles to meet increasingly stringent EPA standards for the reduction of NO_x emissions.
- Operates efficiently from 113°C to as high as 600°C.
- Converts from 83% to greater than 98% of NO_x, depending on temperature.
- Includes no expensive precious metals and requires no complex engine controls.
- Is compatible with existing manufacturing techniques.

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The streaming headlights on a nighttime freeway, symbolic of the traffic carried day and night by U.S. roads, form the background for a heavy truck and a small passenger car. Those vehicles represent the two ends of the automotive spectrum that could benefit from an efficient catalytic system that reduces harmful nitrogen oxide (NO_x) emissions in diesel-engine exhaust.

Summary:

No catalytic system has yet been commercialized that can eliminate nitrogen oxides (NO_x) from the exhaust of vehicles powered by diesel and other lean-burn engines. The problem is temperature: a successful system must operate over the full range of temperatures found in vehicle exhaust: 150°C to more than 500°C, the low temperatures being the most problematic. Los Alamos National Laboratory's NO_x HyCat is the first catalytic system to span this temperature range. The system includes a brand-new, iron-containing zeolite catalyst augmented with cerium-manganese oxide, an oxidizer that produces a near-optimum ratio of NO_x components to speed up the catalytic reaction and enable the zeolite to operate efficiently as a low-temperature catalyst. Los Alamos combines this new low-temperature catalyst with a conventional high-temperature catalyst in a "dual-bed" configuration that provides high rates of NO_x conversion over the broadest temperature range ever achieved.

Development Stage:

Reduced to practice, seeking partners to develop applications.

Patent Status: Patent pending

Licensing Status:

Available for exclusive or non-exclusive licensing for automotive industry applications.

www.lanl.gov/partnerships/license/technologies/

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